CLAIMS

Sub A1

1. An olfactory mucosa stimulating compound screening apparatus, comprising:

an administration means for administering an olfactory mucosa stimulating compound toward an olfactory mucosa of a test animal;

a measuring electrode portion implanted in an olfactory bulb of the test animal for measuring an electrical signal generated in the olfactory bulb;

a processing means for analyzing a correlation between an electrical signal measured by the measuring electrode portion when the olfactory mucosa stimulating compound is administered to the olfactory mucosa of the test animal by the administration means and a physiological response induced in the test animal.

2. An olfactory mucosa stimulating compound screening apparatus according to claim 1, wherein the processing means directly obtains data concerning the physiological response from the test animal, so as to analyze the correlation between the physiological response and the electrical signal obtained by the measuring electrode portion.

3. An olfactory mucosa stimulating compound screening apparatus according to claim 1, wherein the processing means previously stores data concerning an electrical signal in the olfactory bulb which induces a physiological response in the test animal, and analyzes based on the data the correlation between a physiological response and an electrical signal obtained by the measuring electrode portion.

4. An olfactory mucosa stimulating compound screening apparatus according to claim 1, wherein the administration means includes a box for containing the olfactory mucosa stimulating compound, and a nozzle for spraying the olfactory mucosa stimulating compound contained in the box in the vicinity of the olfactory mucosa of the test animal.

5. An olfactory mucosa stimulating compound screening apparatus according to claim 1, wherein the measuring electrode portion has at least one micro electrode for detecting an electrical signal from a nerve cell of the olfactory bulb.

6. An olfactory mucosa stimulating compound screening apparatus according to claim 5, wherein the measuring electrode portion has a plurality of micro electrodes, the micro electrodes being arranged such that an electrical signal pattern generated in the olfactory bulb by administration of the olfactory mucosa stimulating compound to the olfactory mucosa of the test animal is obtained at a plurality of points.

7. An olfactory mucosa stimulating compound screening apparatus according to claim 5, wherein an electrical signal which induces a physiological response in the test animal is supplied to each of the micro electrodes.

8. An olfactory mucosa stimulating compound screening method, comprising steps of:

administering an olfactory mucosa stimulating compound to an olfactory mucosa of a test animal;

measuring an electrical signal generated in the olfactory bulb of the test animal when the olfactory mucosa stimulating compound is administered to the olfactory mucosa

of the test animal; and

analyzing a correlation between the measured electrical signal and a physiological response induced in the test animal.

9. An olfactory mucosa stimulating compound, which presents a correlation between an electrical signal measured by a measuring electrode portion and a physiological response induced in a test animal in the olfactory mucosa stimulating compound screening method recited in claim 8.

10. A treatment apparatus, comprising:

a measuring electrode portion implanted in an olfactory bulb of an organism; and

a means for supplying a stimulation pattern in the olfactory bulb, which induces a physiological response in the organism, to the measuring electrode portion in the form of an electrical signal pattern.

11. A measuring electrode portion, which is implanted in an olfactory bulb of a test animal for measuring an electrical signal generated in an olfactory bulb or supplying an electrical signal to the olfactory bulb, the measuring electrode portion comprising a plurality of micro electrodes, each of which detects an electrical signal from a nerve cell of the olfactory bulb, wherein

the micro electrodes are arranged based on an electrical signal pattern which is generated in the olfactory bulb as a result of administration of an olfactory mucosa stimulating compound to an olfactory mucosa of the test animal.

12. A measuring electrode portion according to claim 11, wherein each of the micro electrodes has an area of 1 μm^2 to 100,000,000 μm^2.

13. A measuring electrode portion according to claim 12, wherein the micro electrodes are arranged in a matrix.

14. A measuring electrode portion according to claim 13, wherein an interval between adjacent micro electrodes is 10 to 10,000 μm.

15. A measuring electrode portion according to claim 11, wherein each of the micro electrodes is placed on a film-shaped substrate.

16. A measuring electrode portion according to claim 15, wherein each of the micro electrodes has the shape of a ring, and is placed around a periphery of a through-hole formed in the substrate.

17. A measuring electrode portion according to claim 16, wherein the inner diameter of the through-hole formed in the substrate is equal to or smaller than 10,000 μm.

18. A measuring electrode portion according to claim 11, wherein: the micro electrodes are provided on a front surface and a back surface at the same positions; each micro electrode provided on one of the surfaces of the substrate detects an electrical signal pattern which induces a physiological response in a test animal; and each micro electrode provided on the other surface of the substrate applies a signal which is the same as or different from the detected signal.

19. A measuring electrode portion according to claim 15, wherein the micro electrodes are formed of any of gold, platinum, ITO, titanium nitride, copper, silver, and tungsten.

20. A measuring electrode portion according to claim 15, wherein the substrate is made of a biomaterial.

21. A measuring electrode portion according to claim 15, wherein the substrate is made of any of polyethylene terephthalate, teflon, silicone rubber, a semiconductor material, and electrically conductive rubber.

22. A measuring electrode portion according to claim 13, wherein: the micro electrode is formed at a tip of a needle-shaped conductive lead; a predetermined number of needle-shaped conductive leads are bound together such that the micro electrodes are placed with a predetermined interval, so as to form an electrode column; and a plurality of electrode columns are placed in parallel to each other with a predetermined interval therebetween.

23. A measuring electrode portion according to claim 22, wherein the needle-shaped conductive lead has a diameter of 1 μm to 1,000 μm.

24. A measuring electrode portion according to claim 22, wherein the needle-shaped conductive lead is formed by covering a needle-shaped conductive material with an insulative film except for the micro electrode at the tip thereof.

25. A measuring electrode portion according to claim 24, wherein the conductive material of the needle-shaped conductive lead is any of gold, platinum, ITO, titanium nitride, copper, silver, tungsten, and conductive rubber.

26. A measuring electrode portion according to claim 24, wherein the insulative film that covers the needle-shaped conductive lead is any of polystyrene, acrylic resins, polycarbonate, polyimide.

27. A measuring electrode portion according to claim 11, wherein the micro electrode is covered with a film of a biomaterial.

28. A measuring electrode portion according to claim 22, wherein the tip of the needle-shaped conductive lead is covered with a film of a biomaterial.

29. A treatment method, comprising steps of:

administering an olfactory mucosa stimulating compound to an olfactory mucosa of a test animal;

measuring an electrical signal generated in an olfactory bulb of the test animal when the olfactory mucosa stimulating compound is administered to the olfactory mucosa of the test animal to obtain an electrical signal pattern;

determining a correlation between the electrical signal pattern, and the type and level of a physiological response induced in the test animal by the electrical signal pattern; and

supplying an electrical signal pattern, which is sufficient for generating an intended physiological response, to an olfactory bulb of the test animal in the form of a stimulation pattern.

30. A method according to claim 29, wherein the intended physiological response is a decrease in the blood pressure.

31. A method according to claim 29, wherein the intended physiological response is a decrease in the blood glucose level.